View metadata, citation and similar papers at core.ac.uk
brought to you by CORE
provided by Elsevier - Publisher Connector

in the A1cheive study. **METHODS:** The CORE Diabetes Model was used to make long-term projections of clinical and cost outcomes associated with a 1% HbA1c reduction based on A1chieve, a global, prospective, observational study of basal, mealtime and biphasic insulin analogs in routine clinical practice. At baseline, mean (SD) patient age was 60 (10) years, duration of diabetes 12 (5) years and HbA1c 9.2 (1.8)%. HbA1c was reduced by 1%-point from baseline in the active group relative to the control group. Life expectancy, complication rates and the cost of complications were projected of a 35-year time horizon. Future costs and clinical outcomes were discounted at 3% annually. Costs are presented in 2011 Algerian Dinar (DZD), converted to Euros (EUR) at an exchange rate of DZD 1:EUR 0.096. **RESULTS:** A 1% reduction in HbA1c was associated with improvements in both clinical and economic outcomes. Undiscounted life expectancy was improved by 0.17 year with a 1% improvement in HbA1c (6.58 versus 6.40 years). The cumulative incidence of all diabetes related complications included in the analysis was lower in the 1% HbA1c reduction group. Complication costs were DZD 9,669 (EUR 93) lower following HbA1c reduction (DZD 387,236 [EUR 3,717] versus DZD 396,905 [EUR 3810]). The most pronounced difference was in the cost of renal complications. **CONCLUSIONS:** Glycemic control in A1chieve patients was generally suboptimal in the Algerian setting. Improvements in glycemic control are likely to lead to substantial clinical and economic benefits due to reduced complication rates. Consequently, the cost-effectiveness of intensifying treatment in these patients is worthy of further analysis.

PDB42

EVALUATING THE CLINICAL AND COST OUTCOMES ASSOCIATED WITH IMPROVING GLYCEMIC CONTROL IN TYPE 2 DIABETES PATIENTS IN INDIA

Todorova L[1], Shah SN[2], Valentine WJ[3]
[1]*Novo Nordisk International Operations, Zurich, Switzerland,* [2]*Bhatia Hospital, Mumbai, India,* [3]*Ossian Health Economics and Communications, Basel, Basel, Switzerland*

OBJECTIVES: Diabetes represents a huge health care challenge for India. Estimates suggest that there are over 61 million people living with diabetes in India (prevalence of 9.2% in adults), and diabetes caused approximately 983,000 deaths in 2011. The aim of this study was to evaluate the benefits in long-term clinical and cost outcomes associated with improving glycemic control in type 2 diabetes patients in India. **METHODS:** Cohort characteristics were based on Indian patients in A1chieve, a global, observational, prospective study of insulin analogs in daily clinical practice. At baseline, patients had a mean (standard deviation) age of 51.8 (10.1) years, duration of diabetes of 6 (4.6) years and glycated hemoglobin (HbA1c) of 8.3% (1.4%). A published and validated model of type 2 diabetes (CORE Diabetes Model) was used to make long-term projections of clinical outcomes and direct costs (2011 Indian Rupees [INR], converted to Euros [EUR] at INR 0.015=EUR 1). Future costs and clinical benefits were discounted at 3% annually. **RESULTS:** Over a 35-year time horizon, reducing HbA1c by 1% was projected to improve mean life expectancy by 0.64 years (10.95 versus 11.59 years) and quality-adjusted life expectancy by 0.53 QALYs (7.36 versus 7.89 QALYs). Benefits were driven by lower complication rates with improved glycemic control. End-stage complications such as myocardial infarction, end-stage renal disease, severe vision loss and lower limb amputation were reduced by 4%, 46%, 33% and 3%, respectively (relative risk). Direct costs were reduced by INR 33,443 (EUR 502) due to complications avoided control (INR 256,101 [EUR 3,842] versus INR 222,659 [EUR 3,340]). **CONCLUSIONS:** HbA1c levels are above guideline targets in India. Improving glycemic control is likely to substantially lower the risk of complications, improve survival and reduce complication costs. Cost-effectiveness analyses of interventions/management programs designed to improve glycemic control are merited for the Indian setting.

PDB43

ECONOMIC EVALUATION OF VILDAGLIPTIN COMPARED TO GLIMEPIRIDE AS ADD-ON TO METFORMIN FOR THE TREATMENT OF DIABETES MELLITUS TYPE 2 PATIENTS IN GREECE

Hatzikou M[1], Rombopoulos G[1], Yfantopoulos J[2]
[1]*Novartis Hellas, Metamorfosis, Greece,* [2]*National and Kapodistrian University of Athens, Athens, Greece*

OBJECTIVES: Evaluate the cost-utility (CUA) of vildagliptin or sulphonylurea as add on to metformin treatment for DMII patients for the Greek NHS **METHODS:** A validated patient level simulation model was used based on UKPDS risk equations (Clarke 2004) to estimate long run micro/macro-vascular complications and mortality over a lifetime horizon. During each cycle a patient can experience different complications: ischemic heart disease, myocardial infarction (MI), chronic heart failure, renal failure, stroke, amputation, blindness in one eye. The outcomes assessment criteria were Quality Adjusted Life Years (QALYs) and Life Years Gained (LYG). Quality of life decrements were derived from literature. Discount rates of 3.5% were set for both costs and outcomes and univariate sensitive analysis was conducted. Drug costs were based on Greek published list prices 2012, while complication cost was obtained from International literature. **RESULTS:** The mean number of QALYs per patient in the lifetime horizon was 6.24 in the vildagliptin&metformin group and 6.16 in sulphonylurea&metformin group, resulting in 0.08 QALYs in favor of vildagliptin&metformin group. Total costs per patient were €7,848 in vildagliptin&metformin group and €7,572 for sulphonylurea&metformin, resulting in €276 cost difference for the latter. The incremental cost effectiveness ratio (ICER) for vildagliptin&metformin versus sulfonylurea&metformin is estimated at €3.371 per QALY for a lifetime horizon. Regarding the analysis on life years gained, vildagliptin&metformin group had on average 8,01 LYG and sulphonylurea&metformin 7,93, leading to a difference of 0.08 years in favour of vildagliptin&metformin. ICER for vildagliptin&metformin versus sulfonylurea&metformin is estimated at €3.424 per life years gained. **CONCLUSIONS:** For the Greek NHS adding Vildagliptin to Metformin is projected to be highly cost-effective for patients with type 2 diabetes who are not at HbA1C goal on Metformin compared to adding SU to Metformin. The price difference of the two comparators is bridged when complications' cost is included in the analysis.

PDB44

LONG-TERM EVALUATION OF THE ECONOMIC IMPACT OF REDUCING HBA1C BY 1% IN TYPE 2 DIABETES PATIENTS IN MEXICO

Todorova L[1], González-Gálvez G[2], Pollock RF[3]
[1]*Novo Nordisk International Operations, Zurich, Switzerland,* [2]*Instituto Jalisciense de Investigacion en Diabetes y Obesidad, Guadalajara, Mexico,* [3]*Ossian Health Economics and Communications, Basel, Switzerland*

OBJECTIVES: Achieving glycemic control forms the cornerstone of type 2 diabetes management and is key in reducing diabetes-related complications. The aim of the current analysis was to investigate the long-term clinical and economic benefits of a 1% reduction in HbA1c in comparison with baseline levels for type 2 diabetes patients enrolled in the A1chieve study (an international, prospective, observational study of insulin analogs within routine clinical practice) in the Mexican setting. **METHODS:** The analysis was performed using the published and validated CORE Diabetes Model, over a 35-year time horizon, with future costs and clinical outcomes discounted at a rate of 3% per annum. At baseline, mean (SD) patient age was 55(13) years, duration of diabetes 11(7.5) years and HbA1c 10.3(2.2)%. An HbA1c reduction of 1% was applied in the active arm, after which it was assumed that HbA1c remained constant. Captured costs included diabetes-related complications and concomitant medications. Costs of antihyperglycemic treatment and adverse events were not included. Costs are presented in 2011 Mexican Pesos (MXN) and converted into Euros (EUR) (MXN 1 to EUR 0.058). **RESULTS:** A 1% reduction in HbA1c was associated with increased life expectancy of 0.51 years (8.70 years versus 8.19 years) and reduced cumulative incidence of all modelled diabetes-related complications. Total mean direct costs were MXN 41,875 (EUR 2,429) lower in patients with HbA1c of 9.3% versus those with HbA1c remaining at 10.3% (MXN 596,985 [EUR 34,625] versus MXN 638,860 [EUR 37,054]). This was driven by savings from the reduced incidence of complications. **CONCLUSIONS:** Baseline glycemic control in A1chieve type 2 diabetes patients in the Mexican setting was generally poor. Even modest improvements in HbA1c are likely to lead to substantial clinical and economic benefits, due to reduced complication rates. Consequently, the cost-effectiveness of intensifying treatment is worthy of further analyses.

PDB45

COST-EFFECTIVENESS OF VILDAGLIPTIN COMPARED TO GENERIC SULPHONYLUREAS ADDED ON TO METFORMIN FROM THE PORTUGUESE SOCIETAL PERSPECTIVE

Calado F[1], Gruenberger JB[2], Silva-nunes J[3], Carvalho D[4]
[1]*Novartis, Sintra, Portugal,* [2]*Novartis, Basel, Switzerland,* [3]*Curry Cabral Hospital, Lisboa, Portugal,* [4]*S. João Hospital / Faculty of Medicine, Porto, Portugal*

OBJECTIVES: Vildagliptin has demonstrated efficacy on HbA1c comparable to glimepiride after 2 years of add-on treatment to metformin with markedly reduced hypoglycemic risk. The current analysis aims to assess the add-on of vildagliptin versus generic sulphonylureas (SUs) to metformin using a cost-effectiveness analysis (CEA) framework from the Portuguese societal perspective. Whilst generic SUs have a lower acquisition price, hypoglycemic events represent a significant economic burden and therefore the CEA framework can contribute to better decision-making. **METHODS:** The CEA utilized a patient level simulation model building on the UKPDS risk equations to estimate micro/macro-vascular complications and mortality over a lifetime horizon. Clinical parameters in the current model include: HbA1c levels, weight gain, systolic blood pressure, total cholesterol, HDL and incidence of hypoglycemic events. Patient distribution on demographic and clinical variables was based on Portuguese epidemiological data. The treatment algorithm allows for treatment switch when: HbA1c goal is not met; drug intolerance; poor compliance. Drug parameters and quality of life decrements were derived from literature. Drug costs were based on Portuguese list prices, while the unit cost of each complication was obtained from the Diagnosis Related Groups tariff. **RESULTS:** On average, the add-on of vildagliptin was estimated to result in a per patient gain of 0.11 QALY and an increase of €1,453 on total cost when compared to the add-on of SU to metformin, resulting in an incremental cost-effectiveness ratio of €12,794/QALY. **CONCLUSIONS:** Under the Portuguese societal perspective, adding vildagliptin is projected to be likely cost-effective for patients with type 2 diabetes who are not at HbA1c goal on metformin compared with adding generic SUs.

PDB46

ANTI-DIABETIC DRUGS AND IN-PATIENT ADMISSIONS ATTRIBUTABLE TO DIABETES IN PORTUGAL

Gouveia M[1], Laires P[2], Borges M[3], Augusto M[4], Martins AP[2]
[1]*Catholic University of Portugal, Lisbon, Portugal,* [2]*Merck, Sharp & Dohme, Oeiras, Portugal,* [3]*University of Lisbon, Lisbon, Portugal,* [4]*CEA, Católica Lisbon School of Business and Economics, Lisbon, Portugal*

OBJECTIVES: Despite the growing incidence of diabetes, the occurrence of complications requiring hospitalization has stabilized in the last decade. Advances in health care and improved access to innovative drugs may have led to these health gains. We aimed to explore the relationship between patients' access to newer oral anti-diabetic drugs (OADs) and the number and costs of hospitalizations attributable to diabetes. **METHODS:** For the period 2000-2009, we collected data on: 1) the number of hospital admissions and their costs attributable to diabetes; 2) the number of patients treated for diabetes per year and health region, based on the OADs consumption ("treated prevalence"); and 3) the evolution of the average "vintage"

(year of marketing approval) of OADs. Using observations for 10 years and five regions, it was possible to estimate a multiple regression model explaining separately hospitalizations and hospital costs attributable to diabetes by regional fixed effects, "treated prevalence" and the average "vintage" of OADs. **RESULTS:** The results showed that the number of hospitalizations attributable to diabetes are proportional to the "treated prevalence", all else constant, but that the more recent the OADs used (higher "vintage"), the lower are hospital admissions (p=0.03) and hospital costs (p=0.007). According to the model, if the average "vintage" of OADs had increased by one year, the number of admissions would have had a 3.8% reduction (3965 less episodes in 2009) and hospital costs would have suffered a 5.3% reduction (about 11 M€ in 2009). **CONCLUSIONS:** The possible influence of other difficult to quantify factors notwithstanding, our analysis suggests that in the last decade the availability of new OADs in the Portuguese market may have played a key role in the reduction of hospital costs and in-patient admissions attributable to diabetes.

PDB47

EFFECTS OF PATIENT-REPORTED NON-SEVERE HYPOGLYCAEMIA ON HEALTH CARE RESOURCE USE AND WORK-TIME LOSS IN SEVEN EUROPEAN COUNTRIES

Geelhoed-duijvestijn PHLM[1], Pedersen-bjergaard U[2], Jensen MM[3], Östenson CG[4]
[1]*Haaglanden Medical Centre, The Hague, The Netherlands,* [2]*Hillerød Hospital, Hillerød, Denmark,* [3]*Novo Nordisk Scandinavia AB, København S, Denmark,* [4]*Karolinska Institutet, Stockholm, Sweden*

OBJECTIVES: Limited data exist on the use of health care resources due to hypoglycaemia induced by antidiabetic treatment. This study investigated the occurrence of self-reported non-severe hypoglycaemic events (NSHE) in type 1 (T1) and insulin-treated type 2 (T2) diabetes patients and their impact on health care resource use. **METHODS:** Insulin-treated T1 and T2 patients from Austria, Denmark, Finland, The Netherlands, Norway, Sweden and Switzerland were invited, primarily via online panels, to complete four questionnaires at weekly intervals. Data were collected on patient demographics, occurrence of NSHE in the last seven days and hypoglycaemia-related resource use. NSHE was defined as an event with symptoms of hypoglycaemia, with or without blood glucose measurement (BGM), or low BGM without symptoms, which the patient could manage without assistance. **RESULTS:** In total, 3958 patients with diabetes entered the study (57% completing all four questionnaires). T1 and T2 patients experienced a mean of 1.7 and 0.5 events/pt-week. Overall employment rate was 48%. Following the last NSHE, the proportion of patients contacting a health care professional was 8% among T2 patients (Austria: 10%, Denmark: 7%, Finland: 10%, Norway: 6%, The Netherlands: 8%, Sweden: 6%, Switzerland: 14%) and 2% among T1 patients (Austria: 3%, Denmark: 1%, Finland: 3%, Norway: 2%, The Netherlands: 3%, Sweden: 1%, Switzerland: 5%). There was a mean increase in BG test use in the week following the last NSHE of 1.9 across countries (Austria: 2.6, Denmark: 1.3, Finland: 2.1, The Netherlands: 2.0, Norway: 1.8, Sweden: 1.5, Switzerland: 1.9). Among employed patients, loss of work-time after the last hypoglycaemic event was reported by 10% (Austria: 10%, Denmark: 9%, Finland: 17%, The Netherlands: 11%, Norway: 9%, Sweden: 12%, Switzerland: 6%). Between countries the average work-time loss among those losing work-time ranged from 1.3 to 6.7 hours. **CONCLUSIONS:** NSHE were associated with use of health care resources and work-time loss in the countries studied.

PDB48

HEALTH CARE RESOURCES UTILIZATION AND COSTS ASSOCIATED WITH THE MANAGEMENT OF PATIENTS WITH ACROMEGALY: AN ANALYSIS BASED ON THE RAMQ DATABASE

Lachaine J[1], Serri O[1], Beauchemin C[1], Hurry M[2], Koch C[2]
[1]*University of Montreal, Montreal, QC, Canada,* [2]*Novartis Pharmaceuticals Canada, Dorval, QC, Canada*

OBJECTIVES: To estimate the health care resource utilization and costs associated with the management of patients with acromegaly in Québec. **METHODS:** A retrospective cohort study was conducted using data from the Quebec public health plan (RAMQ) for the period from January 2001 to June 2011. Patients with at least two diagnosis of acromegaly (ICD9=2530) reported by an endocrinologist or an internist were selected. Characteristics of the study population are described in terms of age, gender and co-morbidities. Health care resources utilization was estimated, in terms of medical/surgical services, hospitalization, emergency visits and medications. Costs of these resources were estimated annually over a three-year period from the time of diagnosis of acromegaly and from the time of specific intervention (transsphenoidal surgery (TSS) or medical treatment). **RESULTS:** A total of 655 patients had at least diagnosis of acromegaly on two occasions reported by an endocrinologist or an internist. Average age was 49.0(SD=19.1) and 55.4% were females. A pituitary adenoma was reported in 27.0% of patients. During the study period, TSS was performed for 20.3% of patients while 19,7% had a medical treatment. Medical therapy included bromocriptine (9.2%), cabergoline (7.6%), octreotide (7.2%), lanreotide (0.5%) and pegvisomant (0.3%). Annual costs for all patients were $7,203(SD=$12,706), $5,038(SD=9,545) and $5,266(SD=12,291) respectively for each of the three year following initial acromegaly diagnosis. For patients who had a TSS or a medical treatment, or a combination of these, total cost in the first year following the initial intervention varies from $9,925 to $17,813. The most frequent comorbidities were diabetes (47.6%) and hypertension (42.7%). Sleep apnea and carpal tunnel syndrome were reported in 11.1% and 5.3% of patients respectively Average annual costs of medications for the treatment of comorbidities were $1,454(SD=3,338). **CONCLUSIONS:** Results of this analysis of the RAMQ database illustrate the significant economic burden of acromegaly and of its comorbidities.

PDB49

COST AND HEALTH CARE RESOURCES UTILIZATION IN THE MANAGEMENT OF CUSHING'S DISEASE: AN ANALYSIS BASED ON THE RAMQ DATABASE

Lachaine J[1], Beauchemin C[1], Koch C[2], Hurry M[2], Lacroix A[3]
[1]*University of Montreal, Montreal, QC, Canada,* [2]*Novartis Pharmaceuticals Canada, Dorval, QC, Canada,* [3]*Centre de Recherche du Centre hospitalier de l'Université de Montréal (CRCHUM),, Montreal, QC, Canada*

OBJECTIVES: To estimate the health care resource utilization and costs associated with Cushing's disease (CD) in Québec. **METHODS:** A retrospective cohort study was conducted using data from the Quebec public health plan (RAMQ) from January 2001 to June 2011. Patients with at least two CD diagnoses (ICD9=2550) were initially selected. CD was further confirmed with at least 2 diagnoses of CD reported by an endocrinologist, or a diagnosis of pituitary adenoma, or a transsphenoidal surgery (TSS) or a bilateral adrenalectomy (BLA). Health care resources comprise medical/surgical services, hospitalization, emergency visits and medications. Costs of these resources were estimated annually over a three-year period from the time of diagnosis of CD and from the time of specific intervention (TSS, BLA or medical treatment). **RESULTS:** Of the 810 patients with two diagnoses of CD, 322 were considered confirmed cases of endogenous CD. The average age was 48.0yrs (SD=16.8) and 72.0% were females. During the study period, TSS and BLA were performed for 23% and 21.1% of patients respectively while 11.8% had a medical treatment to control hypercortisolism. Among these patients 5.9% had two interventions and 0.9% had the three interventions. Annual costs for all patients were $14,451, $5,737 and $5,679 respectively for each of the three year following initial CD diagnosis. For patients who had a TSS, or a BLA, or a medical treatment, or a combination of these, total cost in the first year following the initial intervention varied from $12,258 to $28,888. The most frequent comorbidities were diabetes (58.4%), hypertension (57.8%), and osteoporosis (51.2%). Patients had numerous comorbidities; 85.1% had 2 or more and 69.0% 3 or more. Average annual costs of medications for the treatment of comorbidities were $2,252 (SD=5,713). **CONCLUSIONS:** Results of this analysis of the RAMQ database illustrate the significant economic burden of CD and of its comorbidities.

PDB50

HEALTH CARE RESOURCE UTILIZATION IN THE MANAGEMENT OF CUSHING DISEASE: AN ANALYSIS FROM SOUTH-WESTERN ONTARIO

Petrella RJ[1], Van uum S[1], Hurry M[2]
[1]*Lawson Health Research Institute, London, ON, Canada,* [2]*Novartis Pharmaceuticals Canada, Dorval, QC, Canada*

OBJECTIVES: To examine the demographic and clinical characteristics in patients with Cushing's disease (CD) and to estimate the health care resource utilization associated in these patients in Ontario. **METHODS:** Retrospective analysis of resource use captured in the Southwestern Ontario Database from 2001 to June 2011. A total of 86 patients (72% females) were analyzed based on diagnosis, out of a total population of 523,718 patients. A matched control group (CG) (N=86) was also included from the general population. **RESULTS:** Age of patients at the time of diagnosis was 43±25.4 years (mean ± SD). Baseline co-morbidities (CM) included hypertension (67.4%), dyslipidemia (25%), diabetes (23.3%), renal calculi (17.4%), visual disturbance (20.9%), carpal tunnel syndrome (19.8%) and osteoporosis (11.6%). Distribution of co-morbidities was statistically significantly higher than general population (p-value <0.05); 27% had 2 CM and 35% had 3 or more CM. Baseline Urinary Free Cortisol (UFC) level was 207.7± 118.3 nmol/day (UFC ULN= 110 nmol/day). Primary treatment options included transsphenoidal surgery (TSS), bilateral adrenalectomy (BLA), radiosurgery and medical therapy, used in 79%, 6%, 2.3% and 12.7% of patients respectively. Secondary treatment was surgical in 37% of patients: consisting of repeat TSS in 21%, BLA in 10% and RS in 6%, while the majority received medical therapy (63%). Average length of stay for surgery was 6 days (SD=4) and 9 days (SD=7) for TSS and BLA respectively. Medical therapy, prescribed as monotherapy, included ketoconazole (38%), cabergoline (21%), bromocriptine (20%) and mitotane (15%). Health care provider interactions per year for CD post intervention compared to CG were: Emergency Room visit: 1.01 vs. 0.069; clinic visits: 4.86 vs. 1.89; specialist clinic visits: 5.57 vs. 0.92; and hospitalizations: 0.34 vs. 0.15. **CONCLUSIONS:** This retrospective analysis of patients diagnosed with Cushing's disease indicates that they require substantially higher resource use and experience a high burden of comorbidities.

PDB51

RESOURCE UTILIZATION IN THE MANAGEMENT OF ACROMEGALY: AN ANALYSIS FROM SOUTHWEST ONTARIO

Petrella RJ[1], Van uum S[1], Hurry M[2]
[1]*Lawson Health Research Institute, London, ON, Canada,* [2]*Novartis Pharmaceuticals Canada, Dorval, QC, Canada*

OBJECTIVES: To examine the demographic and clinical characteristics in patients with acromegaly and to estimate the health care resource utilization associated in these patients in Ontario. **METHODS:** Retrospective analysis of resource use captured in the Southwestern Ontario Database from 2001 to June 2011. A total of 131 patients (56% males) were analyzed based on diagnosis, out of a total population of 523,718 patients. A matched control group (CG) (N=131) was also included from the general population. **RESULTS:** Age of patients at the time of diagnosis was 35±25.3 years (mean ± SD). Primary treatment options included transsphenoidal surgery (TSS), radiosurgery and medical therapy, used in 38%, 6% and 56% respectively. Secondary treatment was surgical in 70% of patients: consisting of repeat TSS in 61% and RS in 9%, while 30% received medical therapy. Average length of stay for surgery was 8±8 days in first line TSS. Most frequent post operative complications (>50%) was metabolic-related (81%), gastrointestinal (62%) and fever (38%). Medical therapy, prescribed as monotherapy, included octreotide (47%), lanreotide (33%),